WHAT IS CLAIMED IS:

1.   A moving image coding apparatus for coding noninterlaced moving image data, comprising:

input means for inputting noninterlaced moving image
5   data;

generating means for generating new image data by arranging line data of two consecutive frames in a predetermined order;

subband decomposing means for
10 frequency-transforming the image data to decompose the data into a plurality of subbands;

coding means for coding the image data decomposed into the plurality of subbands; and

output means for outputting the coded image data.
15 2.   The apparatus according to claim 1, wherein said subband decomposing means decomposes the image data into a plurality of subbands by using two-dimensional discrete wavelet transform.

3.   The apparatus according to claim 1, wherein said
20 generating means generates new image data by alternately arranging the line data of the two frames upon changing the order.

4.   The apparatus according to claim 3, wherein

the apparatus further comprises storage means for
25 temporarily storing the line data of one of the two frames, and

said generating means generates new image data by

using the line data of one frame of the moving image data which is directly input and the line data of the frame stored in said storage means.

5. The apparatus according to claim 1, wherein said generating means arranges an odd line of an odd frame and an even line of an even frame on the same line, and arranges an even line of the odd frame and an odd line of the even frame on the same line.

6. A moving image decoding apparatus for decoding interlaced image data from coded data of image data in which line data of two consecutive frames are arranged in a predetermined order, comprising:

input means for inputting the coded data;

subband decoding means for decoding a predetermined subband from the coded data;

subband combining means for reconstructing image data by combining decoded subbands;

frame decomposing means for decomposing the reconstructed image data into odd and even fields; and

output means for outputting decomposed frames.

7 The apparatus according to claim 6, wherein

the apparatus further comprises designation means for designating whether coded data of image data in which line data of two consecutive frames are arranged in a predetermined order is decoded by interlacing or noninterlacing,

if it is designated to perform decoding by

interlacing, said input means inputs only coded data containing no predetermined high-frequency component, and

if it is designated to perform decoding by noninterlacing, said input means inputs coded data associated with all frequency components.

8. A moving image coding method of coding noninterlaced moving image data, comprising:

a generating step of new image data by arranging line data of two consecutive frames of noninterlaced moving image data in a predetermined order;

a subband decomposing step of frequency-transforming the image data to decompose the data into a plurality of subbands; and

a coding means step of coding the image data decomposed into the plurality of subbands.

9. A moving image decoding method of decoding interlaced image data from coded data of image data in which line data of two consecutive frames are arranged in a predetermined order, comprising:

a subband decoding step of decoding a predetermined subband from the coded data;

a subband combining step of reconstructing image data by combining decoded subbands; and

a frame decomposing step of decomposing the reconstructed image data into odd and even fields.

10. The method according to claim 9, wherein

the method further comprises a designation step of

designating whether coded data of image data in which line data of two consecutive frames are arranged in a predetermined order is decoded by interlacing or noninterlacing,

5   in the subband decoding step, if it is designated to perform decoding by interlacing, a subband is decoded by using only coded data containing no predetermined high-frequency component, and

if it is designated to perform decoding by 10 noninterlacing, a subband is decoded by using coded data associated with all frequency components.

11.   A computer program for coding noninterlaced moving image data, wherein a computer is caused to execute:

a generating step of new image data by arranging line 15 data of two consecutive frames of noninterlaced moving image data in a predetermined order;

a subband decomposing step of frequency-transforming the image data to decompose the data into a plurality of subbands; and

20   a coding means step of coding the image data decomposed into the plurality of subbands.

12.   A computer program for decoding interlaced image data from coded data of image data in which line data of two consecutive frames are arranged in a predetermined order, 25 wherein a computer is caused to execute:

a subband decoding step of decoding a predetermined subband from the coded data;

a subband combining step of reconstructing image data by combining decoded subbands; and

a frame decomposing step of decomposing the reconstructed image data into odd and even fields.

5   13.   A moving image coding apparatus for coding noninterlaced moving image data, comprising:

input means for inputting noninterlaced moving image data;

first subband decomposing means for

10   frequency-transforming a predetermined frame of the moving image data to decompose the data into a plurality of subbands;

second subband decomposing means for frequency-transforming a frame next to the frame by a method

15   different from that used by said first subband decomposing means to decompose the frame into a plurality of subbands;

coding means for coding the frame decomposed into a plurality of subbands; and

output means for outputting the coded frame.

20   14.   The apparatus according to claim 13, wherein in said first and second subband decomposing means, decomposition filters applied in first subband decomposition in the vertical direction are shifted from each other by one line.

15.   The apparatus according to claim 13, wherein said

25   first and second subband decomposing means frequency-transform a target frame in the vertical direction to decompose the frame into two subbands, and

decompose one subband the same number of times in the horizontal and vertical directions, thereby decomposing the subband into 3n + 2 subbands.

16. The apparatus according to claim 13, wherein each of said first and second subband decomposing means decomposes a frame into a plurality of subbands by using discrete wavelet transform.

17. A moving image coding apparatus for coding noninterlaced moving image data, comprising:

input means for inputting noninterlaced moving image data;

line shift means for generating a frame by shifting a frame next to a predetermined frame of the moving image data by one-line data in the vertical direction;

subband decomposing means for frequency-transforming the frame shifted from the predetermined frame by one-line data to decompose the frame into a plurality of subbands;

coding means for coding the frame decomposed into a plurality of subbands; and

output means for outputting the coded frame.

18. The apparatus according to claim 17, wherein said subband decomposing means decomposes a frame into a plurality of subbands by using two-dimensional discrete wavelet transform.

19. A moving image decoding apparatus for decoding interlaced image data from moving image data coded by a

moving image coding apparatus defined in claim 13,
comprising:

    input means for inputting coded moving image data;

    subband decoding means for decoding a predetermined

5   subband from the coded moving image data;

    first subband combining means for combining
predetermined subbands decoded from coded data of a
predetermined frame to reconstruct odd fields associated
with the predetermined frame;

10   second subband combining means for combining
predetermined subbands decoded from coded data of a frame
next to the predetermined frame to reconstruct even fields
associated with the predetermined frame; and

    output means for outputting the reconstructed odd or

15   even fields associated with the predetermined frame.

    20.   The apparatus according to claim 19, wherein

    the apparatus further comprises designation means
for designating whether coded data is decoded by
interlacing or noninterlacing,

20   if decoding by interlacing is designated, said input
means inputs only coded data containing no predetermined
high-frequency component, and

    if decoding by noninterlacing is designated, the
input means inputs all coded data, said first subband

25   combining means combines subbands decoded from coded data
associated with an input predetermined frame to reconstruct
the predetermined frame, and said second subband combining

means combines subbands decoded from coded data associated with a frame next to the predetermined frame to reconstruct the next frame.

21. A moving image decoding apparatus for decoding interlaced image data from moving image data coded by a moving image coding apparatus defined in claim 17, comprising:

input means for inputting the coded data associated with a predetermined frame of the moving image data and a frame next to the predetermined frame;

subband decoding means for decoding a predetermined subband from the coded data;

subband combining means for reconstructing the predetermined frame and the frame next to the predetermined frame by combining predetermined subbands decoded from the coded data;

line shift means for shifting line data of the frame next to the predetermined frame by one line; and

output means for outputting an odd field from the predetermined frame, and outputting an even field from the next frame shifted by one line.

22. The apparatus according to claim 21, wherein

the apparatus further comprises designation means for designating whether the coded data is decoded by interlacing or noninterlacing, and

if decoding by interlacing is designated, said input means inputs only coded data containing no predetermined

high-frequency component.

23. The apparatus according to claim 21, wherein

the apparatus further comprises designation means

for designating whether the coded data is decoded by

5 interlacing or noninterlacing, and

if decoding by noninterlacing is designated, said

input means inputs all coded data, and

said output means outputs a predetermined frame

decoded from input coded data and a frame next to the

10 predetermined frame.

24. A moving image coding method of coding noninterlaced

moving image data, comprising:

a first subband decomposing step of

frequency-transforming a predetermined frame of the moving

15 image data to decompose the data into a plurality of

subbands;

a second subband decomposing step of

frequency-transforming a frame next to the frame by a method

different from that used in the first subband decomposing

20 step to decompose the frame into a plurality of subbands;

and

a coding step of coding the frame decomposed into a

plurality of subbands.

25. A moving image coding method of coding noninterlaced

25 moving image data, comprising:

a line shift step of generating a frame by shifting

a frame next to a predetermined frame of the noninterlaced

moving image data by one-line data in the vertical direction;

a subband decomposing step of frequency-transforming the frame shifted from the predetermined frame by one-line data to decompose the frame into a plurality of subbands; and

a coding step of coding the frame decomposed into a plurality of subbands.

26. A moving image decoding method of decoding interlaced image data from moving image data coded by a moving image coding method defined in claim 24, comprising:

a subband decoding step of decoding a predetermined subband from the coded moving image data;

a first subband combining step of combining predetermined subbands decoded from coded data of a predetermined frame to reconstruct odd fields associated with the predetermined frame; and

a second subband combining step of combining predetermined subbands decoded from coded data of a frame next to the predetermined frame to reconstruct even fields associated with the predetermined frame.

27. A moving image decoding method of decoding interlaced image data from moving image data coded by a moving image coding method defined in claim 25, comprising:

a subband decoding step of decoding a predetermined subband from the coded data associated with a predetermined frame of the moving image data and a frame next to the

predetermined frame;

a subband combining step of reconstructing the predetermined frame and the frame next to the predetermined frame by combining predetermined subbands decoded from the coded data;

a line shift step of shifting line data of the frame next to the predetermined frame by one line; and

an output step of outputting an odd field from the predetermined frame, and outputting an even field from the next frame shifted by one line.

28.   A computer program for coding noninterlaced moving image data, wherein a computer is caused to execute:

a first subband decomposing step of frequency-transforming a predetermined frame of the moving image data to decompose the data into a plurality of subbands;

a second subband decomposing step of frequency-transforming a frame next to the frame by a method different from that used in the first subband decomposing step to decompose the frame into a plurality of subbands; and

a coding step of coding the frame decomposed into a plurality of subbands.

29.   A computer program for decoding interlaced image data from coded moving image data, wherein a computer is caused to execute:

a subband decoding step of decoding a predetermined

subband from the coded moving image data;

a first subband combining step of combining predetermined subbands decoded from coded data of a predetermined frame to reconstruct odd fields associated

5 with the predetermined frame; and

a second subband combining step of combining predetermined subbands decoded from coded data of a frame next to the predetermined frame to reconstruct even fields associated with the predetermined frame.

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